



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,797	12/12/2001	Jean-Manuel Van Thong	200301974-1	9151
7590	12/21/2004		EXAMINER	
IP Administration, Legal Department, M/S 35 Hewlett-Packard Company P. O. Box 272400 Fort Collins, CO 80527-2400			STORM, DONALD L	
			ART UNIT	PAPER NUMBER
			2654	

DATE MAILED: 12/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/017,797	THONG ET AL.
	Examiner Donald L. Storm	Art Unit 2654

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 12/12/01 through 3/25/02.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) 14-28 is/are allowed.
- 6) Claim(s) 1,4-7 and 10-13 is/are rejected.
- 7) Claim(s) 2,3,8 and 9 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 12 December 2001 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/25/02.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR § 1.83(a) because they fail to clearly show significant features of the subject matter specified in the claims. See MPEP § 608.02(d). At a minimum, representation of the following features should be added to the drawings to show the claimed invention as a whole:

The combined set has a predefined number of matches (claim 1 and others).

2. A permanent replacement sheet (a minimum being a black ink sketch suitable for publication) in compliance with 37 CFR 1.121(d) containing at least the corrected, substitute drawing for each figure being corrected is required in response to this Office action. Any amended, replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. Corrected drawing sheets may no longer be held in abeyance. **REPLACEMENT SHEETS LESS THAN THE MINIMUM DESCRIBED ABOVE WILL NOT BE CONSIDERED A BONA FIDE**

ATTEMPT TO PROVIDE A COMPLETE REPLY. See 37 C.F.R. § 1.121(d), § 1.81(d), § 1.85(a), and MPEP § 608.02 IV.

Specification

3. The title is objected to because it is not sufficiently descriptive of the invention. A new title is required that is clearly indicative of the invention to which the claims are directed. See MPEP § 606.01. The Examiner suggests that the Applicant consider a title including these elements: "Systems and Methods for Combining Subword Recognition and Whole Word Recognition of A Spoken Input."

4. The abstract is objected to under 37 C. F. R. § 1.72 because it does not describe the disclosure sufficiently, particularly the matter claimed as new. A cursory inspection of the abstract should inform readers of the nature and gist of the technical disclosure. See MPEP § 608.01(b). Appropriate correction is required. The following additional matter contained in the disclosure should be briefly mentioned:

- a. the combined set has a predefined number of matches (claim 1 and others);
- b. sorting the source set of reference patterns based on a closeness of each reference pattern to correctly matching the input pattern based on generated patterns comparisons (claim 14 and others).

Claim Informalities

5. Claims 2, 3, 8, and 9 are each objected to as being dependent upon a rejected base claim. See MPEP § 608.01(n)V. Each claim would be allowable over the prior art of record if rewritten to include all of the limitations of its base claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Kanazawa

7. Claims 1, 5-7, and 11-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Kanazawa et al. [US Patent 5,315,689].

8. Regarding claim 7, Kanazawa [at Fig. 1] describes a computer system for determining a plurality of hypothetical matches to a spoken input by describing the content and functionality of the recited limitations recognizable as a whole to one versed in the art as the following terminology:

a subword decoder for detecting subword units in the spoken input to generate a first set of hypothetical matches to the spoken input [see Fig. 1, items speech, 10, 30, 31, 32, 33, 34, and their descriptions especially at column 5, lines 25-40, of the second word recognizing section for receiving speech, segmentation, labeling, performing phoneme-based matching, and outputting candidates];

a word decoder detecting words in the spoken input to generate a second set of hypothetical matches to the spoken input [see Fig. 1, items speech, 10, 20, 21, 22, 23, and their descriptions especially at column 4, line 59-column 5, line 24, of the first word recognizing section for receiving speech, detecting end points, extracting a word speech pattern, obtaining similarities, and outputting word categories and their similarity values];

a list fusion module for combining the first set of hypothetical matches with the second set of hypothetical matches to produce a combined set of hypothetical matches to the spoken input [see Fig. 1, items 20, 30, 41, Fig. 9, and their descriptions of Process 3(iii) especially at column 11, line 58-column 12, line 12, of the total decision section setting n' number of candidates of word-based matching (for $n'=1$ or $n' \geq 2$) and n number of candidates of phoneme-based matching (for $n \geq 1$ or $n \geq 2$);

the combined set has a predefined number of hypothetical matches [at column 11, line 68-column 12, line 2, as two or more categories satisfying the conditions for n' candidates and n candidates].

9. Regarding claim 11, Kanazawa also describes:

the subword units include a phoneme [at column 5, lines 25-40, as segment and label phonemes for phoneme-based matching].

10. Regarding claim 12, Kanazawa also describes:

the hypothetical matches are words [at column 5, lines 20-21 and 44-45, as word categories and word recognition candidates].

11. Claims 1, 5, and 6 set forth a method with limitations comprising the functionality associated with using the system recited in claims 7, 11, and 12. Because Kanazawa describes the similar limitations as indicated there, these claims thus are anticipated accordingly.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Kanazawa and Meador

13. Claims 4, 10, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanazawa et al. [US Patent 5,315,689] in view of Meador, III et al. [US Patent 5,638,425].

14. Regarding claim 10, Kanazawa describes the included claim elements as indicated elsewhere in this Office action. Kanazawa also describes:

the combined set of hypothetical matches is a list based on ranking levels for each hypothetical match [at column 11, line 68-column 12, line 2, as two or more categories satisfying the conditions for n' candidates and n candidates having similarity values].

However, Kanazawa does not explicitly describe the similarities are confidence levels and that that the combined list is ordered.

Meador [at Fig. 3] also describes parallel phoneme-word and whole-word recognition of input speech with lists of results of each recognition combined into one list. Meador also describes:

the combined set of hypothetical matches is an ordered list based on ranking confidence levels for each hypothetical match [see Fig. 8, first column, third column, fourth column, and their descriptions especially at column 21, lines 1-3, of generating a joint-confidence function where word-recognition confidence figures (column 2) and phoneme-recognition confidence figures (column 5) have already been obtained and listing in order of joint confidence (sixth column)].

Meador shows that combined set of hypothetical matches is an ordered list based on ranking confidence levels for each hypothetical match was known to artisans at the time of invention. Since Meador [at column 2, lines 42-47] also points out that a decision is required of whether or not the highest probability has produced a satisfactory result, it would have been obvious to one of ordinary skill in the art of speech recognition at the time of invention to include the concepts described by Meador at least a combined set of hypothetical matches is an ordered list based on ranking confidence levels for each hypothetical match to determine if Kanazawa's similarity values are satisfactory because the confidence levels would provide a decision of whether or not Kanazawa's highest similarity has produced a satisfactory recognition result to be output.

15. Claim 4 sets forth a method with limitations comprising the functionality associated with using the system recited in claim 10. Because Kanazawa and Meador describe and make obvious the similar limitations as indicated there, this claim thus is anticipated accordingly.

16. Claim 13 sets forth limitations similar to limitations set forth in claim 7 where the means (subword decoder, word decoder, list fusion module) are satisfied by the software instructions embodied on a computer useable medium for providing the claimed functionality. Kanazawa describes those limitations as indicated there.

However, Kanazawa does not explicitly describe computer program instructions embodied on a computer useable medium for executing steps to provide the claimed functionality.

Meador [at Fig. 3] also describes parallel phoneme-word and whole-word recognition of input speech with lists of results of each recognition combined into one list. Meador also describes:

computer program instructions embodied on a computer useable medium for executing steps [at column 10, lines 22-26, as hardware boards and software programs].

To the extent that computer program instructions embodied on a computer useable medium are not necessarily in Kanazawa's system, it would have been obvious to one of ordinary skill in the art of implementing systems to provide operations described by functional descriptions at the time of invention to include Meador's concept of hardware with software program instructions to implement the processing functions as Kanazawa's system because that would have provided the best implementation under particular circumstances identified and evaluated by a skilled artisan. For example, it is within the ordinary skill of an artisan to determine that software elements, such

as Meador's concept, benefits changing processing functions or adding other processing functions because software elements are more easily modified than hardware elements.

Allowable Subject Matter

17. Claims 14-28 are allowed.

The allowable subject matter of independent claims 14, 21, and 28 resides in the whole structure and interaction expressed by the combination of all limitations compared to the prior art of record. No particular reference provides relevant, objective evidence to make the claimed systems or method obvious by changing the closest prior art (Kanazawa, Meador) way of generating lists of recognition results to include the claimed sorting the set of reference patterns based on the closeness of each reference pattern to correctly matching the input, particularly when the reference patterns are based on a pronunciation dictionary.

18. Claims 2 and 8 recite allowable subject matter when considered with the limitations of the base claims.

The allowable subject matter of claims 2 and 8 resides in the whole structure and interaction expressed by the combination of all limitations including the base claim compared to the prior art of record. No particular reference provides relevant, objective evidence to make the claimed systems or method obvious by changing the closest prior art (Kanazawa, Meador) way of generating lists of recognition results to include the claimed sorting the set of reference patterns based on the closeness of each reference pattern to correctly matching the input, particularly when subword-recognition results and word-recognition results are generated and combined.

19. Claims 3 and 9 recite allowable subject matter when considered with the limitations of the base claims.

The allowable subject matter of claims 3 and 9 resides in the whole structure and interaction expressed by the combination of all limitations including the base claim compared to the prior art of record. No particular reference provides relevant, objective evidence to make the claimed systems or method obvious by changing the closest prior art (Kanazawa, Meador) way of forming a combined list of recognition results to include the claimed combined set having ordered word recognition results followed by ordered subword recognition results, particularly when the combined set has a predefined number of results.

Conclusion

20. The following references here made of record are considered pertinent to applicant's disclosure:

Gould et al. [US Patent 5,920,837] describes speech recognition using both phoneme-based recognition models and whole-word recognition models to produce a predetermined number of listed results.

Brown et al. [US Patent 6,061,654] describes speech recognition using both word and subword recognition with a confusion matrix to evaluate the appropriateness of candidate matches.

21. Any response to this action should be mailed to:

Mail Stop Amendment

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

or faxed to:

(703) 872-9306, (for formal communications intended for entry)

Or:

(703) 872-9306, (for informal or draft communications, and please label
"PROPOSED" or "DRAFT")

Patent Correspondence delivered by hand or delivery services, other than the USPS, should be addressed as follows and brought to U.S. Patent and Trademark Office, 220 20th Street S., Customer Window, **Mail Stop Amendment**, Crystal Plaza Two, Lobby, Room 1B03, Arlington, VA, 22202

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donald L. Storm, of Art Unit 2654, whose telephone number is

(703) 305-3941. The examiner can normally be reached on weekdays between 8:00 AM and 4:30 PM Eastern Time. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (703) 305-9645.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Inquiries regarding the status of submissions relating to an application or questions on the Private PAIR system should be directed to the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028 between the hours of 6 a.m. and midnight Monday through Friday EST, or by e-mail at: ebc@uspto.gov. For general information about the PAIR system, see <http://pair-direct.uspto.gov>.

December 13, 2004

Donald L. Storm
Donald L. Storm
Patent Examiner
Art Unit 2654